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The Effects of a 12-Week Tai Chi and Qigong Training on Lower Limb Muscle Strength, Flexibility, and Balance in Elderly Women: A Controlled Experimental Study

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Abstract

Background and Aim: Age-related declines in lower limb muscle strength, flexibility, and balance significantly increase the risk of falls and functional limitations in elderly women. Traditional mind-body practices such as Tai Chi and Qigong have shown promise in promoting physical health among older adults. This study aimed to evaluate the effects of a 12-week integrated Tai Chi and Qigong intervention on lower limb muscle strength, flexibility, balance, and physiological indicators in elderly women.

Materials and Methods: A controlled experimental design was employed, involving 40 elderly women aged 60–74 years. Participants were randomly assigned to either an experimental group (n = 20), which received the intervention, or a control group (n = 20), which maintained their usual routines. All participants completed pre-test and post-test assessments using standardized tools, including wall squats, half-squat kettlebell lift, sit-and-reach tests, seated hand back pull, single-leg stands, time up and go, and blood pressure measurements. Statistical analyses were conducted with the significance level set at $p < 0.05$.

Results: Post-intervention analysis revealed that the experimental group showed statistically significant improvements in lower limb muscle strength, flexibility, and balance compared to the control group ($p < 0.05$). Additionally, there were notable reductions in BMI and blood pressure among participants in the intervention group ($p < 0.05$).

Conclusion: The 12-week Tai Chi and Qigong intervention was effective in enhancing key physical functions in elderly women. These findings support the integration of culturally rooted, low-impact exercise programs into public health strategies for aging populations, offering a practical, evidence-based approach to fall prevention and holistic wellness promotion.

Keywords: Tai Chi; Qigong; Elderly Women; Muscle Strength; Flexibility; Balance; Controlled Experiment

Introduction

The aging population in China is expanding rapidly, with over 178 million people aged 60 or older recorded in the 2010 census, and projections exceeding 400 million by 2050. This demographic shift presents critical health challenges, particularly a decline in lower limb muscle strength, flexibility, and balance, increasing the risk of falls and loss of independence in elderly individuals (Pan et al., 2017). Addressing these issues is a national priority, as reflected in government initiatives such as the National Fitness Plan (2016–2020) and the Traditional Chinese Medicine Health Service Plan (2015–2020).

Tai Chi, a traditional Chinese martial art, is widely recognized for its physical and mental health benefits. It emphasizes slow, fluid movements and breath control, helping improve strength, joint stability, and postural balance (Chen, 2020). Similarly, Qigong, another traditional practice, enhances internal energy flow, respiratory efficiency, and neuromuscular coordination through deep breathing and meditative movements

While existing studies have demonstrated the effectiveness of Tai Chi or Qigong separately, few have explored the combined effects of these practices on elderly women's physical performance. This demographic often experiences compounded challenges due to aging-related physiological decline, psychosocial stress, and reduced access to structured physical activity.

This study aims to investigate the impact of a 12-week integrated Tai Chi and Qigong program on lower limb muscle strength, flexibility, and balance in women aged 60 to 74. By filling a gap in the literature, this research seeks to provide empirical support for incorporating culturally appropriate, low-impact interventions into community health programs for older adults.

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Objectives

This study aims to assess the impact of a 12-week Tai Chi combined with Qigong training program on physical function in elderly women. Specifically, it investigates whether this integrative intervention can produce significant improvements in three domains: lower limb muscle strength, flexibility, and balance ability. A controlled experimental design with pre-test and post-test assessments was adopted to compare physical performance between the intervention group and a control group that maintained their usual daily routines. The results are intended to provide empirical evidence supporting health promotion and fall prevention strategies for the elderly, and to advocate for the incorporation of culturally appropriate, low-impact traditional exercise modalities into geriatric health intervention programs.

Literature review

With the rapid acceleration of population aging in China, the health concerns of elderly women have emerged as a significant social and health challenge. By the end of 2020, China had approximately 190 million people aged 65 or older, underscoring the urgency of addressing elderly health from a national strategic perspective, as reflected in the "Healthy China 2030" initiative. Elderly women, in particular, face heightened health risks compared to their male counterparts, including higher incidences of chronic diseases, obesity, osteoporosis, and compromised mental health (He et al., 2023). The socioeconomic vulnerability of elderly women—manifested in lower economic status, limited political engagement, and poor health outcomes—further emphasizes the necessity of tailored health interventions and enhanced social support structures (Zare et al., 2018).

Tai Chi, a traditional Chinese exercise form, has been increasingly recognized as a beneficial physical activity intervention, particularly suitable for elderly women due to its accessibility, gentle movements, and low-impact nature. Existing studies indicate that regular Tai Chi practice significantly enhances lower limb muscle strength, joint flexibility, balance control, and overall physical function in elderly populations (Chen, 2020). Additionally, Tai Chi has demonstrated psychological benefits, reducing symptoms of anxiety, depression, and cognitive decline, thus contributing positively to both physical and mental well-being among elderly practitioners (Li et al., 2017).

Specifically regarding lower limb strength, multiple studies affirm that long-term Tai Chi practice effectively mitigates age-related muscle deterioration and improves dynamic balance, thus reducing fall risk among elderly individuals (Jiang & Li, 2024; Sun et al., 2023). Likewise, improvements in flexibility, crucial for mobility and daily functioning, have been consistently reported in elderly Tai Chi practitioners. Regular Tai Chi sessions significantly enhance joint range of motion and neuromuscular coordination, thereby facilitating functional independence and reducing injury risks associated with aging (Liu & Zhou, 2012).

Balance capability, essential for maintaining independence and quality of life in elderly women, has also been positively influenced by Tai Chi training. Studies highlight Tai Chi's effectiveness in improving both static and dynamic balance, reducing fear of falling, and enhancing overall physical stability (Chen et al., 2023). However, despite the extensive research supporting Tai Chi's effectiveness, there remains limited empirical evidence specifically addressing the combined impact of Tai Chi and Qigong on elderly women's lower limb muscle strength, flexibility, and balance simultaneously.

Complementing Tai Chi, fitness Qigong—a traditional Chinese practice emphasizing controlled breathing, posture, and mental concentration—has shown promising results in enhancing respiratory efficiency, muscular strength, flexibility, and psychological well-being (Guo & Si, 2024; Chan & Tsang, 2019). Practitioners of fitness Qigong report significant improvements in neuromuscular coordination and overall physical responsiveness compared to non-practitioners, highlighting its potential as a complementary therapeutic intervention for elderly populations.

In summary, while extensive evidence supports the individual benefits of Tai Chi and fitness Qigong, there is a notable research gap regarding their integrated application for elderly women's comprehensive physical health. This study aims to fill this gap, providing empirical evidence on the effectiveness of a

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combined Tai Chi and Qigong training program in improving lower limb strength, flexibility, and balance among elderly women.

Conceptual Framework

This study is guided by the Holistic Health Model and Functional Exercise Theory, which together support the use of integrated physical and mental training for promoting elderly well-being. Based on this foundation, a 12-week culturally-adapted Tai Chi and Qigong intervention was designed as a low-impact, accessible form of functional exercise suitable for aging populations.

The intervention aims to improve muscle strength, flexibility, and balance, which are critical components of mobility and fall prevention in elderly women. Enhanced physical function resulting from these improvements is expected to reduce the risk of falls and support independent living.

As illustrated in Figure 1, the conceptual framework follows a linear path from theoretical foundation, through intervention, to physiological improvements, ultimately leading to better functional outcomes for elderly women.

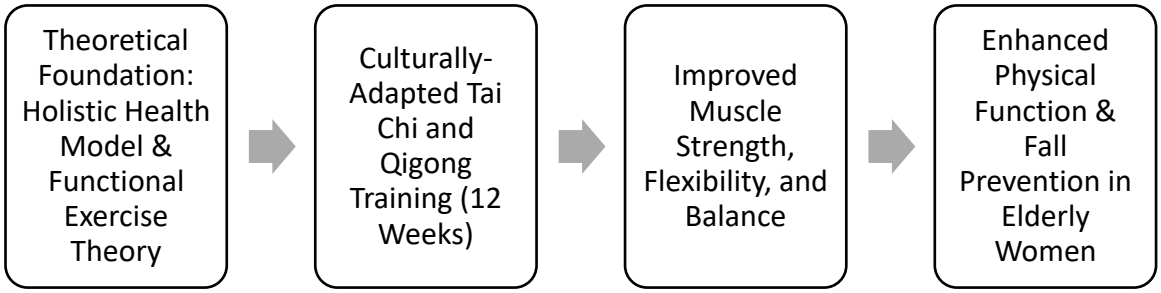

Figure 1 Conceptual Framework of the Tai Chi and Qigong Intervention for Elderly Women

Methodology

Research Design

This study utilized a controlled experimental design with pre-test and post-test assessments to evaluate the effects of a 12-week Tai Chi and Qigong combined training program on elderly women's lower limb muscle strength, flexibility, and balance. Both the experimental and control groups were assessed at two time points—before (pre-test) and after (post-test) the intervention period—using standardized evaluation tools. This approach allowed for both within-group comparisons and between-group comparisons, thereby strengthening the validity of the outcome evaluation. The experimental group participated in structured Tai Chi and Qigong exercises, while the control group continued their regular daily activities without engaging in additional structured physical exercise. Such a controlled experimental design enabled clear comparison of intervention outcomes, thus ensuring scientifically robust conclusions regarding the intervention's effectiveness.

Specifically, the experimental intervention involved simplified 24-style Tai Chi and Baduanjin Qigong exercises, conducted three times per week (Monday, Wednesday, and Friday) from 7:00 to 8:00 am over 12 weeks. Each session included 10 minutes of warm-up, 30–40 minutes of main exercise, and 10 minutes of relaxation. The training intensity was monitored using the Rating of Perceived Exertion (RPE) scale, ranging between 9–13 during the first four weeks, and increased to 14–16 from weeks five to twelve. Conversely, the control group did not participate in any structured physical activity, thus providing a baseline reference for evaluating the intervention's impact.

Research Subjects

A total of 40 elderly women, aged 60 to 74, from an elderly community in Xi'an were selected through purposive sampling based on specific inclusion criteria. Participants were randomly divided into two equal groups: an experimental group (n=20) receiving Tai Chi and Qigong training, and a control group (n=20) continuing their usual lifestyle without additional physical training.

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Inclusion criteria included: female participants aged 60-74 years; free from hypertension, diabetes, Parkinson's disease, osteoarthritis, or lower limb injuries within the past two years; ability to independently complete daily activities; no prior systematic Tai Chi or similar structured fitness training; and good compliance with expected attendance rates over 80%.

Exclusion criteria included: presence of chronic illnesses or medication use conflicting with the intervention; and unwillingness to discontinue conflicting medications or supplements during the study.

Ethical approval was obtained before study initiation (approved on November 26, 2024). All participants provided informed consent, and measures were taken to ensure confidentiality, participant safety, and privacy throughout the study duration.

Research Testing

The participants were tested for general physiological status, namely weight and height, body mass index, and blood pressure—both systolic and diastolic (Mercury sphygmomanometer and stethoscope).

Wall Squat Test (Wang, 2015): Participants stood against a wall, knees and hips at 90-degree angles, maintaining the position as long as possible. Duration was recorded in seconds, indicating lower limb muscular endurance.

Half-Squat Kettlebell Lift Test (Shao, 2019): Participants lifted kettlebells from a half-squat position, gradually increasing the weight until unable to maintain proper form. The maximum successfully lifted weight was recorded, reflecting lower limb muscle strength.

Sit and Reach Test: Participants sat on the ground, extended legs straight, reached forward as far as possible, and the maximum forward distance reached was recorded, indicating hamstring and lower back flexibility.

Seated Hands Back Pull Test: Participants sat upright, reached both hands behind their back, and attempted to clasp their hands together. The shortest distance between their palms was measured, reflecting shoulder and upper body flexibility.

Single Leg Stand Test: Participants stood on one foot with eyes open, attempting to maintain balance as long as possible. The duration was recorded, evaluating static balance ability.

Timed Up and Go Test: Participants stood from a seated position, walked straight forward for three meters, returned, and sat down. Completion time was recorded to assess dynamic balance and functional mobility.

Data Analysis

Statistical analyses were conducted using SPSS software (version 26.0). Descriptive statistics, including means and standard deviations, were calculated to summarize baseline participant characteristics and outcome measures. Independent-sample t-tests were used to compare differences between the experimental and control groups after the intervention period. Paired-sample t-tests were employed to analyze within-group changes from pre-test to post-test assessments. The significance level was set at $p < 0.05$. All analyses were conducted to determine the intervention's effectiveness in improving lower limb muscle strength, flexibility, and balance in elderly women.

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Results

Table 1 Baseline Characteristics of Participants in the Experimental and Control Groups

Group	N	Age (years)	Height (m)	Weight (kg)	Systolic Blood pressure (mmHg)	Diastolic Blood pressure(mmHg)
Experimental Group	20	67.05±2.1	1.54±0.03	54.9±2.4	126.4±5.8	78.2±4.9
Control Group	20	66.02±2.5	1.55±0.04	55.1±2.6	125.9±6.1	77.8±5.2

Table 1 summarizes participants' baseline characteristics. No significant differences were found between the experimental and control groups in age, height, weight, or blood pressure, indicating comparable baseline profiles.

Table 2 Comparison of BMI and Blood Pressure Before and After the Intervention Between Groups

Muscle Strength Test	Group	Pre-test	Post-test
BMI (Kg/m²)	Experimental Group	24.8 ± 1.1	23.6 ± 1.0*#
	Control Group	24.7 ± 1.3	24.6 ± 1.2
Systolic Blood Pressure (mmHg)	Experimental Group	126.4 ± 5.8	118.2 ± 5.1*#
	Control Group	125.9 ± 6.1	124.8 ± 5.7
Diastolic Blood Pressure (mmHg)	Experimental Group	78.2 ± 4.9	72.6 ± 4.4*#
	Control Group	77.8 ± 5.2	77.1 ± 5.0

(*$p < 0.05$ compared to the control group and pre-test baseline)

Table 2 shows that the experimental group experienced significant improvements in BMI, systolic blood pressure, and diastolic blood pressure after the 12-week Tai Chi and Qigong intervention, while the control group showed no meaningful changes.

Table 3 Comparison of Lower Limb Muscle Strength Before and After the Intervention Between Groups

Muscle Strength Test	Group	Pre-test	Post-test
Wall Squat (s)	Experimental Group	18.70±4.87	22.65±5.08*#
	Control Group	19.10±5.21	19.15±5.43
Half-Squat Kettlebell (lbs)	Experimental Group	14.15±2.78	16.55±2.89*#
	Control Group	13.35±2.62	13.35±2.87

(*$p<0.05$ compared to control group; #$p<0.05$ within group pre-post intervention)

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The experimental group demonstrated significant improvements in lower limb muscle strength compared to the control group post-intervention (Table 3). Wall squat endurance and half-squat kettlebell lifting capacity both increased significantly ($p < 0.05$).

Table 4 Comparison of Flexibility Measures Before and After the Intervention Between Groups

Flexibility Test	Group	Pre-test	Post-test
Sit and Reach (cm)	Experimental Group	1.64±0.51	3.59±0.77*#
	Control Group	1.67±0.49	1.76±0.57
Seated Hands Back Pull-L (cm)	Experimental Group	1.21±0.13	3.26±0.68*#
	Control Group	1.20±0.14	1.26±0.34
Seated Hands Back Pull-R (cm)	Experimental Group	2.36±0.41	4.40±0.74*#
	Control Group	2.28±0.28	2.47±0.47

(*p<0.05 compared to control group; #p<0.05 within group pre-post intervention)

Significant improvements were observed in trunk and shoulder flexibility in the experimental group compared to controls ($p < 0.05$, Table 4).

Table 5 Comparison of Balance Performance Before and After the Intervention Between Groups

Balance Test	Group	Pre-test	Post-test
Single-Leg Stand-L (s)	Experimental Group	11.50±1.70	13.35±1.87*#
	Control Group	10.95±1.88	10.85±2.30
Single-Leg Stand-R (s)	Experimental Group	12.80±2.19	14.75±2.17*#
	Control Group	13.25±2.05	13.15±2.46
Timed Up-and-Go (s)	Experimental Group	5.73±1.04	3.24±0.91*#
	Control Group	5.94±1.05	5.96±0.92

(*p<0.05 compared to control group; #p<0.05 within group pre-post intervention)

Balance capacity significantly improved in the experimental group post-intervention. Single-leg stand time and the timed up-and-go performance improved markedly ($p < 0.05$, Table 5).

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Conclusion

The findings of this study demonstrate that the 12-week Tai Chi and Qigong intervention had a significant positive impact on lower limb muscle strength, flexibility, balance, and physiological health in elderly women. In terms of muscle strength, participants in the experimental group exhibited notable improvements in both wall squat endurance and half-squat kettlebell performance, indicating enhanced muscular endurance and lower extremity strength. These improvements are particularly meaningful in the context of maintaining mobility, independence, and quality of life among older adults.

Regarding flexibility, the intervention led to significant gains in both hip and shoulder mobility, as evidenced by improved sit-and-reach and back-hand touch test scores. Enhanced flexibility reduces musculoskeletal discomfort, improves posture, and contributes to injury prevention, which is especially critical in aging populations.

Balance performance also improved markedly in the experimental group. Significant gains were observed in both static (single-leg stance) and dynamic (timed up-and-go) balance tests. These findings are particularly relevant to fall prevention strategies, as impaired balance is a leading risk factor for falls among older adults.

Additionally, the intervention produced significant improvements in physiological indicators. Participants in the experimental group showed reductions in body mass index (BMI) and blood pressure. These physiological changes suggest systemic health benefits beyond musculoskeletal function, including improved cardiovascular health and potential reductions in chronic disease risk.

Furthermore, the addition of systolic and diastolic blood pressure as baseline and post-intervention variables reinforces the comprehensive nature of this study's physiological assessment. The observed reductions in both systolic and diastolic blood pressure among participants in the experimental group further substantiate the cardiovascular benefits of Tai Chi and Qigong, emphasizing their potential as effective non-pharmacological interventions for promoting heart health in elderly populations.

Taken together, these results provide strong empirical support for the integration of Tai Chi and Qigong into elderly health promotion programs. As culturally relevant, low-impact exercise modalities, they offer a holistic approach to enhancing physical function and reducing health risks in aging populations. This study contributes valuable evidence to the growing body of research advocating for traditional movement therapies in geriatric care.

Discussion

This study systematically evaluated the effects of a 12-week combined Tai Chi and Qigong training program on elderly women aged 60–74 years. The results indicated significant enhancements in lower limb muscle strength, flexibility, and balance in the experimental group compared to the control group. Additionally, the intervention led to notable improvements in physiological health markers, including a reduction in Body Mass Index and blood pressure, suggesting positive impacts on both musculoskeletal and cardiovascular health.

These improvements can be attributed to the multifaceted physiological and neuromuscular mechanisms activated by Tai Chi and Qigong. The program's combination of weight-bearing movements, dynamic balance tasks, and mind–body coordination promotes neuromuscular adaptation, circulatory regulation, and metabolic efficiency. The progressive and repetitive nature of the movements facilitates muscle recruitment, joint lubrication, and autonomic balance, collectively leading to enhanced physical function and systemic health improvements. Participants showed notable improvements in Body Mass Index and blood pressure. In addition to improvements in the musculoskeletal system, this intervention also demonstrated positive effects on key physiological health indicators, namely blood pressure and Body Mass Index (BMI). Participants in the experimental group showed a significant reduction in blood pressure compared to the control group, which can be explained by several physiological mechanisms. The deep, slow, and rhythmic breathing patterns characteristic of Tai Chi and Qigong stimulate the parasympathetic nervous system, resulting in a reduced heart rate and vasodilation, both of which contribute to lowering

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blood pressure. Moreover, the moderate-intensity aerobic nature of these exercises helps improve vascular elasticity and decreases peripheral vascular resistance—two critical factors in blood pressure regulation. These findings are consistent with previous studies indicating that regular Tai Chi practice can effectively lower blood pressure in both hypertensive and normotensive older adults (Yeh et al., 2008).

Similarly, a significant reduction in BMI was observed in the experimental group, which may be attributed to increased energy expenditure from the continuous, full-body movements inherent in Tai Chi and Qigong practice. These exercises engage multiple muscle groups in a coordinated and sustained manner, promoting fat metabolism even at low intensity levels and enabling prolonged activity without excessive fatigue(Izquierdo et al., 2021). Given their gentle and low-impact nature, these exercises are particularly well-suited for the elderly. These physiological outcomes underscore the value of integrating traditional mind–body exercises into elderly health promotion programs safely and effectively.

Specifically, participants showed notable improvements in exercises measuring both static and dynamic muscle strength, such as the Wall Squat and Half-Squat Kettlebell Lift. These exercises continuously engage major muscle groups, including the quadriceps, gluteus maximus, and core muscles. Regular activation of these muscles leads to increased muscle mass and enhanced motor unit recruitment, contributing to overall strength gains. This aligns with the principle of progressive overload in sports science, which states that gradually increasing the demand placed on the musculoskeletal system stimulates adaptation and improvements in muscular strength (Chaves et al., 2024).

Improvements in flexibility were evident through performance gains in the Sit and Reach and Seated Hands Back Pull tests. The slow, continuous movements characteristic of Tai Chi and Qigong gently stretch the muscles and tendons surrounding the joints—particularly in the lower back, hamstrings, and shoulders. These movements help explain the significant improvements observed in flexibility-related assessments. Repeated stretching over prolonged periods promotes increased flexibility by inducing structural adaptations in connective tissues and reducing mechanical resistance. This process supports joint mobility and enhances range of motion, which are especially beneficial for older adults in maintaining functional independence (Zou et al., 2017).

Significant improvements in balance, as demonstrated by enhanced performance in the Single-Leg Stand and Timed Up-and-Go tests, can be attributed to the mindful and controlled weight-shifting movements inherent in Tai Chi and Qigong practice. These exercises enhance proprioception—the body's awareness of its position in space—as well as neuromuscular coordination, both of which are critical for maintaining postural stability. Furthermore, the training stimulates the central nervous system to better regulate balance control mechanisms, thereby improving the body's ability to respond effectively to unexpected external forces. This enhanced response capability helps reduce the risk of falls, which is a major concern for older adults. Overall, these improvements reflect the positive impact of Tai Chi and Qigong on postural control and functional mobility in aging populations (Chen et al., 2023).

The findings underscore the practical value and empirical effectiveness of Tai Chi and Qigong as safe, accessible, and impactful interventions for elderly health promotion. This combined approach not only strengthens key muscle groups and improves joint flexibility but also significantly enhances balance, thus reducing fall risk and supporting independence in daily activities. These results align with previous studies, which have demonstrated the effectiveness of Tai Chi and Qigong in improving balance, reducing anxiety and depression, and enhancing overall quality of life among older adults (Li et al., 2017; Cao et al., 2024).

Furthermore, this research contributes valuable empirical evidence supporting the integration of traditional physical exercises into elderly care programs, filling an existing gap in the literature concerning the combined effects of Tai Chi and Qigong. The structured program provided by this study offers a practical and replicable model for elderly health interventions, aligning well with public health initiatives such as the Healthy China 2030 Plan. Given these clear benefits, structured Tai Chi and Qigong training programs should be recommended and widely promoted within elderly care settings to optimize health outcomes and enhance the quality of life among older populations.

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Recommendation

Expanded Recommendations

Based on the statistically significant outcomes of this study, it is strongly recommended that structured Tai Chi and Qigong training programs be systematically incorporated into elderly care services and community health promotion frameworks. These traditional mind–body exercises demonstrate considerable potential as safe, low-cost, and culturally appropriate interventions for aging populations.

1. Community-Based Implementation

Community health centers, senior activity centers, and residential communities should **regularly offer Tai Chi and Qigong classes** tailored to older adults. Establishing consistent and long-term programs can help ensure sustained participation rather than short-term engagement. Regular practice has been shown to improve balance, flexibility, muscle strength, and coordination, thereby significantly **reducing fall risk**, which is a major cause of injury and loss of independence among older adults. Furthermore, these programs promote **self-efficacy and independence in daily living**, contributing to healthier aging and reduced healthcare burden.

2. Professional Training and Standardization

To maximize safety and effectiveness, **professional training programs** should be developed for community health workers, rehabilitation specialists, and fitness instructors. These programs should emphasize:

- Standardized movement techniques
- Proper progression of exercise intensity
- Age-appropriate modifications
- Safety precautions for individuals with chronic diseases or mobility limitations

Well-trained instructors can ensure consistent quality of instruction, reduce injury risk, and adapt exercises to meet diverse physical conditions, thereby improving participant adherence and outcomes.

3. Policy Support and Resource Allocation

Governmental and public health authorities should actively support the integration of Tai Chi and Qigong into public health strategies by **allocating funding, facilities, and organizational support**. Aligning these initiatives with national health promotion frameworks—such as **Healthy China 2030**—can enhance policy coherence and sustainability. Institutional backing can also facilitate program evaluation, scaling, and long-term monitoring, ensuring that traditional exercise interventions become an integral component of preventive geriatric healthcare.

Expanded Recommendations for Future Research

While the present study provides meaningful evidence regarding the benefits of Tai Chi and Qigong for older adults, further research is needed to strengthen and broaden these findings.

1. Larger and More Diverse Samples

Future studies should aim to **increase sample size** and recruit participants from **diverse geographic regions, socioeconomic backgrounds, and cultural contexts**. This would enhance the representativeness of the findings and improve their generalizability across different populations. Multi-center or cross-cultural studies may also help identify contextual factors that influence program effectiveness and participation rates.

2. Broader Health Outcome Measures

To obtain a more comprehensive understanding of the impact of Tai Chi and Qigong, future research should incorporate **additional physiological and psychological indicators**, including:

- Cognitive function (e.g., memory, attention, executive function)
- Emotional well-being (e.g., stress, anxiety, depression)
- Social engagement and loneliness
- Overall quality of life and life satisfaction

Including these multidimensional outcomes would allow researchers to better capture the **holistic health benefits** of mind–body exercise interventions and clarify the mechanisms underlying their effects.

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